





The Naval Regional Medical Center, San Diego, a world-renowned institution known formerly as the Balboa Naval Hospital, is the largest military medical complex in the world. Yet this institution finds itself at a CROSSROADS with mounting problems of inadequate facilities. This brochure illuminates these problems and presents two alternatives for their solution.



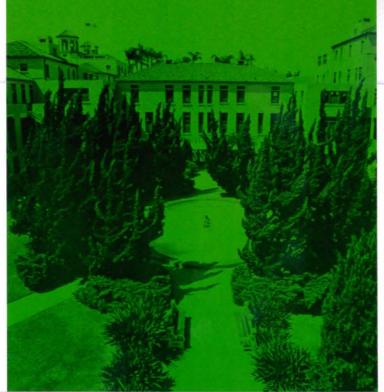


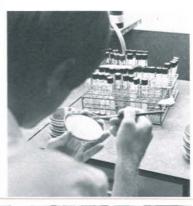
REGIONAL HEALTH CARE SYSTEM



The Naval Regional Medical Center, San Diego, commissioned as a Naval Hospital in 1919, is now preeminent among military health care facilities and serves a combined active duty, dependent, and retired military population in excess of 350,000.

Under the Regional Health
Care System, expedient, quality
patient care is achieved in San
Diego by centralizing
administration and inpatient
care at the Naval Hospital and
dispersing outpatient service
through eleven regional
dispensaries. The provision of
convenient outpatient services
to surrounding eligible
population centers and the
consolidation of sophisticated
inpatient, diagnostic, and
treatment facilities at one
central site are two basic
objectives fulfilled by the
regional system.





NAVAL REGIONAL MEDICAL CENTER

The Naval Regional Medical Center is located on a prominent seventy-seven acre site in Balboa Park, adjacent to downtown San Diego. In addition to the Navy-owned property, an adjoining 7.26 acres is leased from the City for parking and recreational facilities.





The majority of the seventyseven buildings in the medical complex were completed in the early nineteen twenties and originally provided bed space for less than 300 patients. During World War II, several wooden barrack structures were added to accommodate the sharp increase in patient load. A 1000-bed surgical facility, known as Building 26, was constructed in 1957. Since that time, construction of additional patient care facilities has been limited to a threestory outpatient clinic dedicated in 1969.

Additional support functions accommodated on the Balboa Park site include a Naval School of Health Sciences, bachelor enlisted quarters, service and maintenance facilities, and various personnel support and recreational facilities. As a result of physical and functional obsolescence, only seven of the existing buildings are considered adaptable, with considerable expense, to building and safety code requirements of today.

The vast numbers of people involved in the day-to-day operations of Naval Regional Medical Center are indicative of its magnitude and complexity.

The FY 1974 work load included an average daily inpatient census of 1,255 as well as 2,500 outpatient visits per day. The staff comprises 750 officers, 1,200 enlisted personnel and 930 civilians. The Naval School of Health Sciences has a staff of



123 and an average student enrollment of 975. It is estimated that the average daily population present at any one time, including visitors, exceeds 7,000 persons.



A MOUNTING LEGACY OF PROBLEMS

The physical development of the Naval Regional Medical Center has, since its inception, been sporadic and haphazard, lacking the benefits of comprehensive master planning. The effect of this piecemeal growth is a fragmentation of basic patient services, inefficient use of staff and facilities, chaotic traffic and circulation patterns, high maintenance costs, and an inability to adopt many new medical management practices. The resulting sprawl has saturated the present site and little new construction can be accomplished without disrupting patient care and training operations.

Individually, many of the major buildings of the medical complex house activities other than that for which they were designed. Their configuration, structural design, and inadequate utility systems limit their capacity for modernization or modification for other uses.

It has been increasingly difficult, and in many instances impossible, to maintain modern standards of patient care in these obsolete and inadequate facilities. This has placed the accreditation of the Medical Center with various agencies in serious jeopardy. The culmination of these growing problems is an immediate need for major corrective action. Extensive engineering and planning studies conducted over the past three years have illuminated the more serious problems, and these are described in the following pages.

PROBLEM: FRAGMENTATION OF FACILITIES

With growth based on expediency of need, many departments and functions are now scattered throughout the Medical Center complex. Effective administration of these departments is an impossible task. Necessary communication, involving record keeping and transfer, is delayed beyond acceptable levels. Food and supplies must be transported to eight separate buildings, using



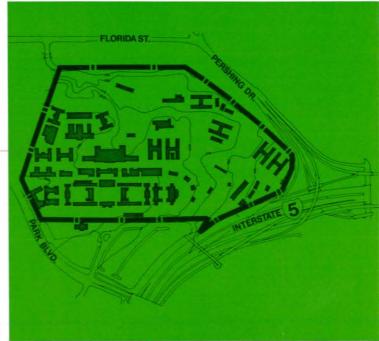
exterior covered walks and ramps to accommodate the three-level configuration of the Hospital grounds. Duplication of staff and equipment is an unfortunate necessity. More importantly, this situation requires that outpatients travel considerable distances between parking lots and the various clinics, and that inpatients be frequently transported between buildings for special studies and procedures.









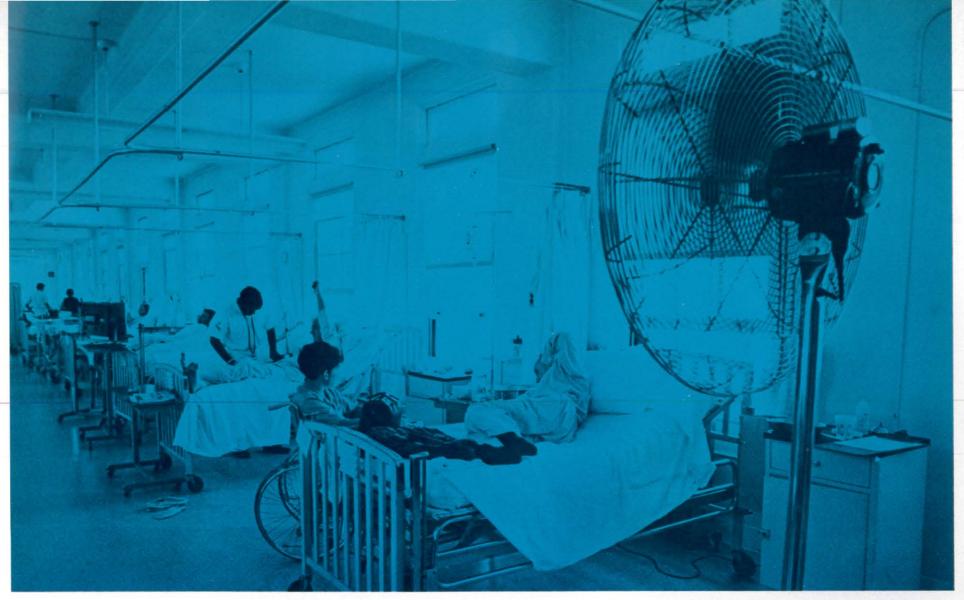


PROBLEM: SITE LIMITATIONS

The present site, comprised of seventy-seven acres, is surrounded by public land: Balboa Park, city streets and freeways. There is no reasonable possibility of securing additional land at this site. Grade elevations on the site vary a maximum of 140 feet.

Although the original central medical complex was constructed on the major plateau at the higher portion of furthermore, does not address the site, other buildings have had to utilize the remainder of the site which slopes down to the south and east into graded stepped platforms. This site is now saturated and further development or reconstruction can only be accommodated by consolidation and vertical

expansion, with consequent disruption of ongoing functions. This option, completely the problems of aircraft noise and safety hazard.



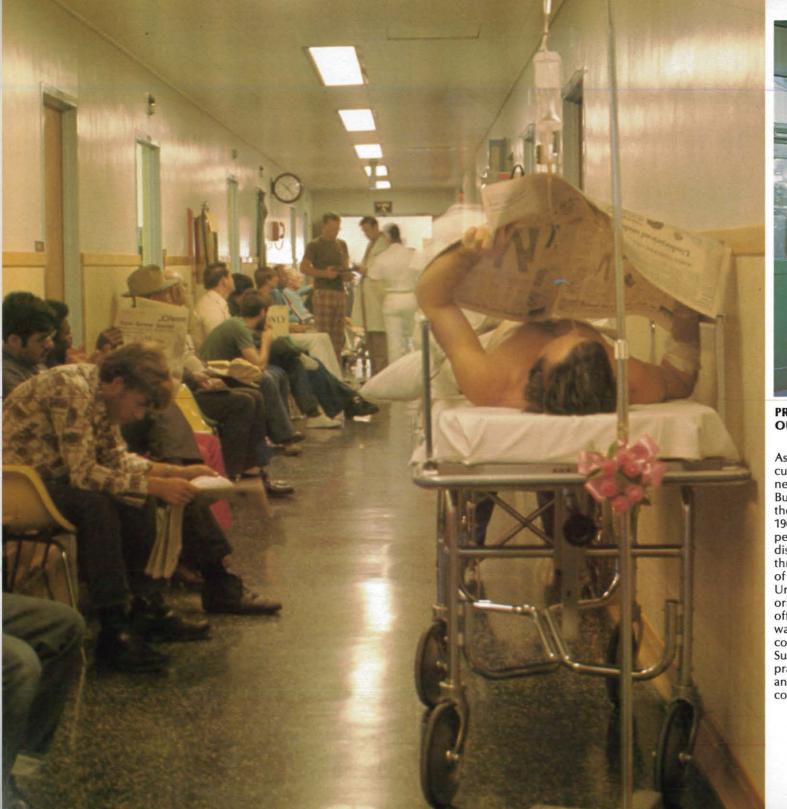
PROBLEM: INADEQUATE **INPATIENT FACILITIES**

Of the 1,420 patient beds presently authorized, 650 can be accommodated in the major The service core facilities for inpatient facility, Building 26. Constructed in 1957, as a 1,000bed surgical hospital, the bed capacity has been reduced to accommodate medical clinical space. The bulk of the nursing

units in the nine-level structure are twenty-bed open wards. these units are minimal and inconveniently arranged. Storage area is inadequate. There is no air conditioning and, because of open windows, aircraft and street noise is excessive.

The remaining 770 patient beds are located in eleven separate buildings in the old central medical complex, where open

wards accommodate as many as forty beds each. Exterior corridors, running parallel with the units, preclude any privacy for the patient. In addition, exit capabilities are minimal and do not comply with present safety codes. Old and worn interior surfaces, extensive molding, and steam radiators produce high maintenance costs.





PROBLEM: INADEQUATE OUTPATIENT FACILITIES

As a result of severe funding cutbacks the Medical Center's newest outpatient clinic, Building 29, was undersized at the time of its completion in 1969. Accordingly, about ninety percent of the clinical space is dispersed in sixteen buildings throughout the complex. Some of these clinics, such as Urology, are housed in spaces originally planned as staff offices adjacent to patient wards and use the public corridor as a waiting room. Such make-shift facilities practically eliminate privacy and violate national safety codes.







PROBLEM: INADEQUATE ANCILLARY SERVICES

Most of the medical service departments have had haphazard growth and are thus scattered throughout the site. Radiology and the clinical laboratory, for instance, are located in old, obsolete buildings which cannot accommodate the flexibility of structure and utilities required for these functions. Surgery, located in the third basement of Building 26, is subject to flooding and is also incapable of expansion. The pharmacy waiting room is an open shed adjacent to a busy service road.



The constrictions of inadequate and obsolete facilities impede the continued technological development of these essential elements of quality patient care.



PROBLEM: TRAFFIC AND PARKING

Parking requirements for the present Medical Center, based on Navy criteria, indicate a need for 3,700 spaces. There are now 1,510 parking spaces on Navy-owned land; however, due to the limitations of the site, most of these spaces are curbside locations. An

additional 1,160 spaces are in use on adjacent City-owned land, but the future availability of this land is uncertain. All outpatients using the City-operated parking lot are separated by a distance of some 275 yards and a long flight of steps from the scattered clinics.

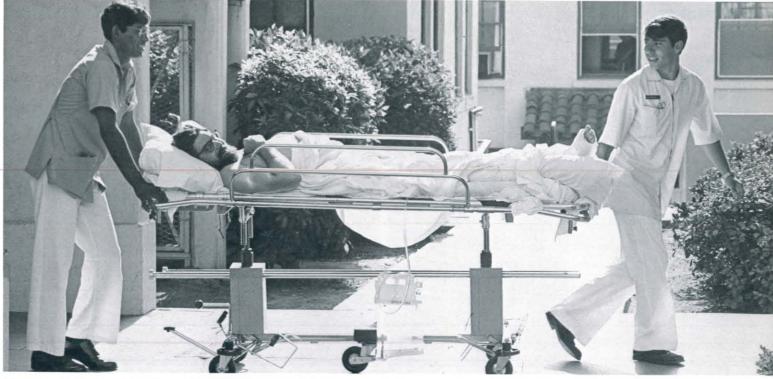
Access to the Medical Center is limited to either the main entrance, in a congested portion of the site, or a remote SORKY service access on a secondary street. Roads throughout the complex are narrow, containing parking on one or both sides,

service access on a secondary street. Roads throughout the complex are narrow, containing parking on one or both sides, and emergency and service vehicles must compete with staff, visitor and outpatient traffic. Loading docks occur at the curb and many streets have been relegated to one-way traffic. The result is a chaotic situation, particularly during rush hour or in an emergency.

PROBLEM: LOGISTICS

Logistics involving the transportation of people, material, supplies, records, equipment and waste in an institution of this size is a major consideration. Logistical problems are compounded at the Medical Center due to numerous separate buildings at various elevations, exterior corridors, narrow interior corridors and a limited number of elevators, all of which prevent the installation of any type of modern material-handling system.

Food is transported long distances by cart through several buildings to nursing units. Pharmaceutical supplies are transported in hand baskets or by cart across service roads, over sidewalks and curbs. Patients must be transported through exterior corridors to the cardiac intensive care unit.



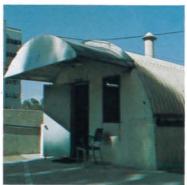


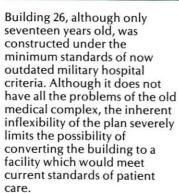


PROBLEM: OBSOLETE BUILDINGS

The plan and configuration of buildings in the old medical complex do not easily lend themselves to the remodeling required to accommodate modern practice of medicine. Lighting and ventilation systems are generally below minimum standards in these structures, while plumbing fixtures and equipment are antiquated and totally inadequate. Many of these structures, with open stairways, narrow corridors, and inadequate exits, are in direct violation of National Fire **Protection Association** standards.









Seventeen buildings, with 520,000 square feet of area, were built prior to World War II. Eight temporary wood barrack structures, built during World War II, are still in use for enlisted men's housing, classrooms and contingency nursing units. Life-cycle costing methods indicate the older buildings are beyond their useful life. Maintenance costs are high and valuable energy sources are wasted.



PROBLEM: EARTHQUAKE VULNERABILITY

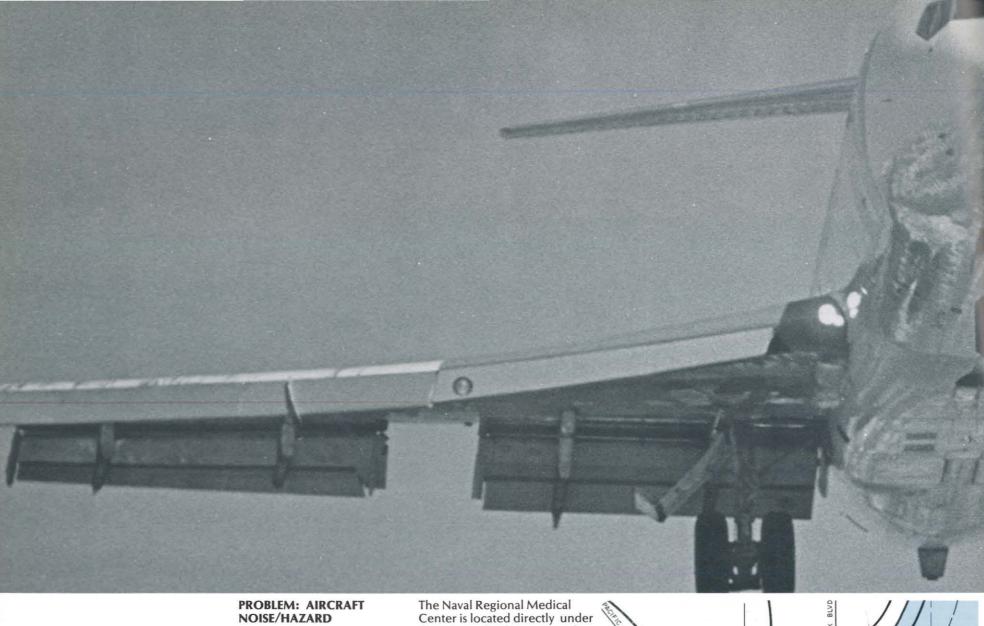
Adequacy of structures to withstand earthquakes is a major concern in the San Diego area. The Medical Center complex is situated within the most restrictive seismic zone, according to both the 1973 California Uniform Building Code and Naval Facilities Engineering Command seismic

design criteria. The Elsinore Fault, forty-two miles away, is capable of producing an earthquake with a probable magnitude of 7.3 and an acceleration of twenty percent gravity with a sixty-year frequency. In recorded history, San Diego has not experienced a major tremor, thus increasing the probability of such an event.

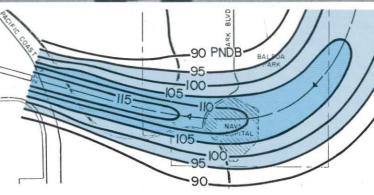


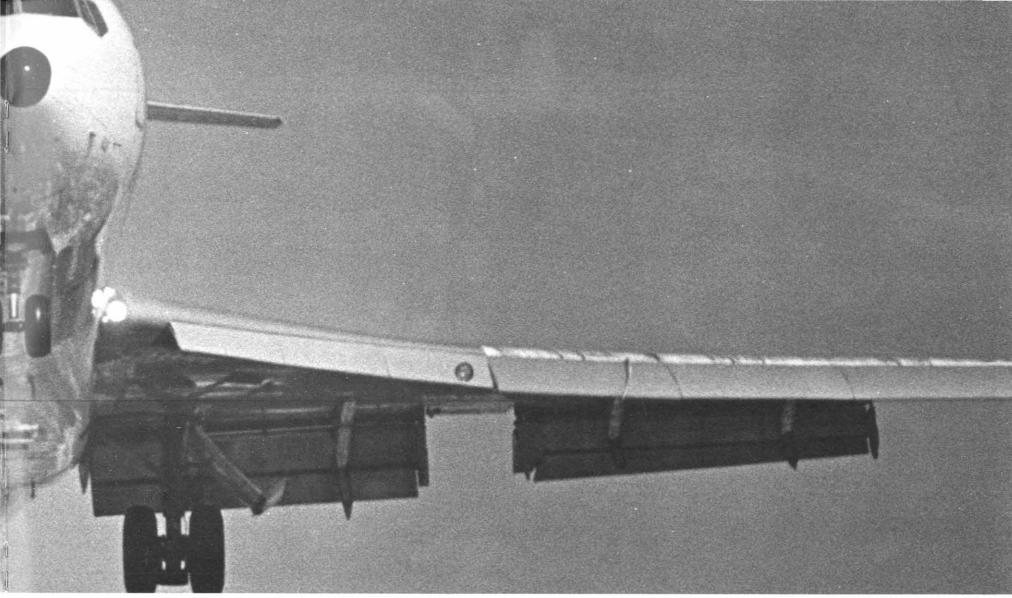
The structures of the old medical complex are of concrete frame with unreinforced masonry walls, identical in construction to the Veterans Administration Hospital in San Fernando which collapsed in an earthquake in 1971. Supplemental reinforcement to make these buildings structurally adequate would require approximately seventy-five percent of the cost (structure only) of replacement.

It is estimated that alterations necessary to make Building 26 comply structurally with the applicable codes would cost in excess of \$1,500,000.



Center is located directly under the primary landing approach to San Diego International Airport, approximately 10,000 feet from the end of the runway. Measurements indicate that arriving aircraft over the site create an average Perceived Noise Level (PNdB) of 110 as compared to the maximum PNdB of 65 for the continuous background noise level of a daytime urban residential area.





Composite Noise Ratings (CNR) 3; therefore, any new developed for land use planning, assign three noise zones in the land area surrounding an airport facility, with Zone 3 being the area having the greatest noise pollution and Zone 1 having the least. Department of Defense criteria strictly prohibit new hospital construction in CNR Zones 2 and 3. The Naval Regional Medical Center, San Diego, is located in CNR Zone

construction in the Balboa Park area would be in direct violation of this Department of Defense regulation.

The potential for a major aircraft disaster involving the hospital is a real and serious concern in view of the fact that the current aircraft glide slope is only 250 feet above the buildings of the Medical Complex.

An analysis of the problems outlined having been completed, the next step was to seek and develop a reasonable solution. Upon a thorough evaluation of several proposals, the choices were limited to either rebuilding at the Balboa Park site or relocating to the new site of Murphy Canyon Heights.



SOLUTION A: RECONSTRUCTION AT BALBOA PARK

The capital investment at the present site, the central geographical location and the pleasant park environment influenced the planners to explore the concept of rebuilding at the present location. The goal for this solution was to accomplish the following:

- 1. Physically reorganize functions within existing permanent facilities.
- 2. Modernize existing facilities.
- 3. Define scope and siting of new construction.
- 4. Provide adequate on-base parking.
- 5. Develop efficient traffic circulation.
- 6. Create suitable outdoor recreation space.

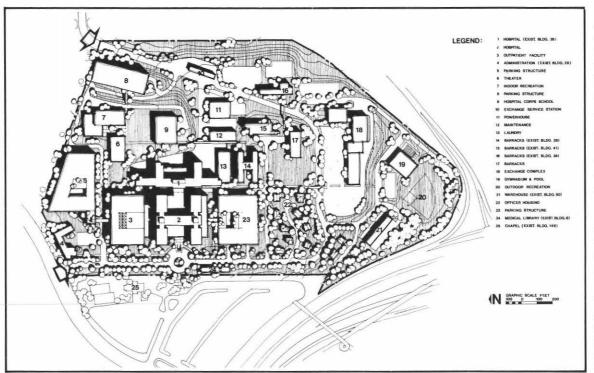
As the studies progressed and serious problems were encountered, it became evident that less of the existing institution could be remodeled and that more comprehensive steps would have to be taken in order to accomplish the stated goals.











BALBOA PARK SITE: ULTIMATE DEVELOPMENT PLAN The Ultimate Development Plan proposes to consolidate all patient care facilities into a large central medical complex. This complex, with a common service base, would retain existing Building 26,

remodeling it into a light care and service facility, and would expand to the west in the form of a new acute care hospital and outpatient clinic. Seven other existing structures would be retained; the remainder would be demolished to provide sites for new construction.

Other facilities, grouped relative to their function and their relationship to the medical complex, include the Naval School of Health Sciences, bachelor enlisted men's housing, Navy Exchange complex, and recreational facilities. Three large parking structures are proposed to accommodate the parking needs within the site.

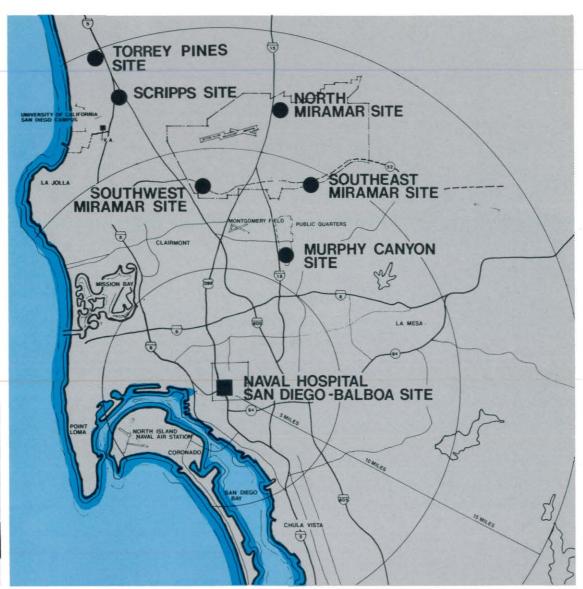
This plan was based on a phased construction schedule, with total redevelopment occuring in five increments, to permit continuity of essential functions.

SOLUTION A: REACTION

The studies involved in the development of the Master Plan at the Balboa Park site indicated that considerably more reconstruction would be required than originally contemplated. The phased construction schedule required to permit continuous operation of the Medical Center on the presently crowded site implies both a lengthy period of reconstruction and an escalating cost factor. In addition, this plan would not resolve the aircraft noise and hazard problems. These considerations, along with the expressed desire of the City of San Diego to return the Balboa site to park use, prompted the Navy to consider relocation to an alternate site.



The firm of Neptune and Thomas Associates, Architects and Engineers, was retained by Western Division, Naval **Facilities Engineering** Command, to study fifteen sites in addition to the present Balboa Park location. Of these alternate sites, six were finally



selected for in-depth evaluation. Four of these sites were Navy-owned and two were City-owned. The conclusion of this Alternate Site Assistant Secretary of Defense Study in March 1973, strongly endorsed the need for a new facility and recommended the that which best fulfilled the

A memorandum to the Assistant acquisition of some additional Secretary of the Navy (Manpower and Reserve Affairs), from the Deputy (Health Resources and Programs) dated 18 June 1973, stated that "after thorough Murphy Canyon Heights site as study of alternative locations for facility at Murphy Canyon". the new Naval Hospital for San Medical Center's requirements. Diego, the Murphy Canyon area has been selected as the most desirable site. We have recently become aware that the

land is being considered to assure maximum space to accommodate the hospital. You are therefore authorized to continue planning to replace the facility currently located in Balboa Park with the required



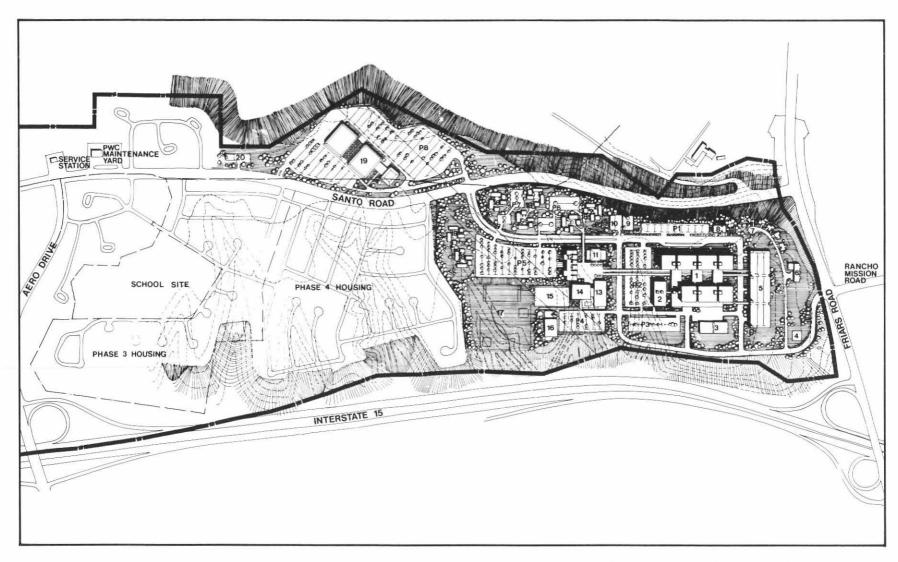
SOLUTION B: NEW CONSTRUCTION AT MURPHY CANYON HEIGHTS

Murphy Canyon Heights is an elevated plateau of approximately 814 acres located seven miles northeast of the Balboa Park site. The Navy owns 710 acres of the site, which was originally planned for family quarters. On the northern portion of the site, 1,496 units of housing have been completed with an additional 825 units planned for construction immediately to the south.



Three major planning considerations of this site for the Medical Center are the irregular topography, the power transmission line easement through the north portion of the site, and the extension of the major access road within the site at a gradient acceptable for use by the Medical Center.

The proposed site for the Naval Regional Medical Center comprises approximately 152 gross acres which includes the remaining southern end of the Navy-owned property (forty-eight acres), a twenty-three acre parcel owned by the City of San Diego, four acres owned by the State of California, and seventy-seven acres owned by the American Housing Guild, a private development corporation.



MURPHY CANYON SITE: ULTIMATE DEVELOPMENT PLAN The concept developed in this study accommodates the project requirements defined by the Bureau of Medicine and Surgery; in essence, a 900-bed acute care hospital, a 300-bed light-care facility, and outpatient clinics serving 2,615 daily visits. These elements, including extensive diagnostic, therapeutic and service departments, would be contained in a central structure. A parking structure terraced

into the adjacent hillside would allow patients immediate access to facilities. A large service court would consolidate service and emergency functions with immediate access from the secondary entrance road.

The Naval School of Health Sciences complex, together with indoor Recreation and a theater, would be located adjacent to the hospital. Bachelor enlisted quarters, accommodating 2,000 men and women, would be located convenient to the School as well as the hospital. There is also adequate acreage to accommodate a gymnasium, swimming pool and outdoor recreation facilities adjacent to the hospital site.

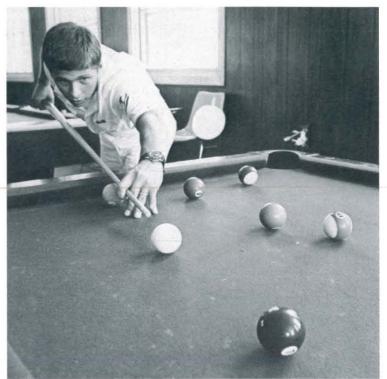
The family housing area will accommodate 825 new units and will be an extension of the existing housing area. A Commissary Store and Navy





Exchange complex, not included in this project, is separated from, but conveniently located adjacent to, the hospital site as well as the housing area. Religious, educational and service facilities are located near the areas they serve.

Senior officers' quarters and a Navy Lodge are located to the



south of the site, overlooking Mission Valley, convenient to the Medical Center but isolated by topography and landscape screen.

In developing this plan, effort has been made to

accommodate a phased program. In this manner, the various components may be completed as required for full operation and as funding is available.

COMPARATIVE ANALYSIS

A comparative analysis of the merits of the two solutions is described in the following pages and emphasizes some of the major planning considerations affecting a final recommendation.

The ELIGIBLE POPULATION
MAP shows the location, by
duty-station, of active-duty
military and civilian employees,
and by residence, of retired

military and dependents. The majority of future population growth in the San Diego area is predicted to continue in a north and northeast direction.

Although a large eligible population is presently centered at the San Diego Bay area, it is composed primarily of single active-duty men and women stationed at the Naval Training Center, Marine Corps Recruit Depot, Naval Air Station, North Island, Naval



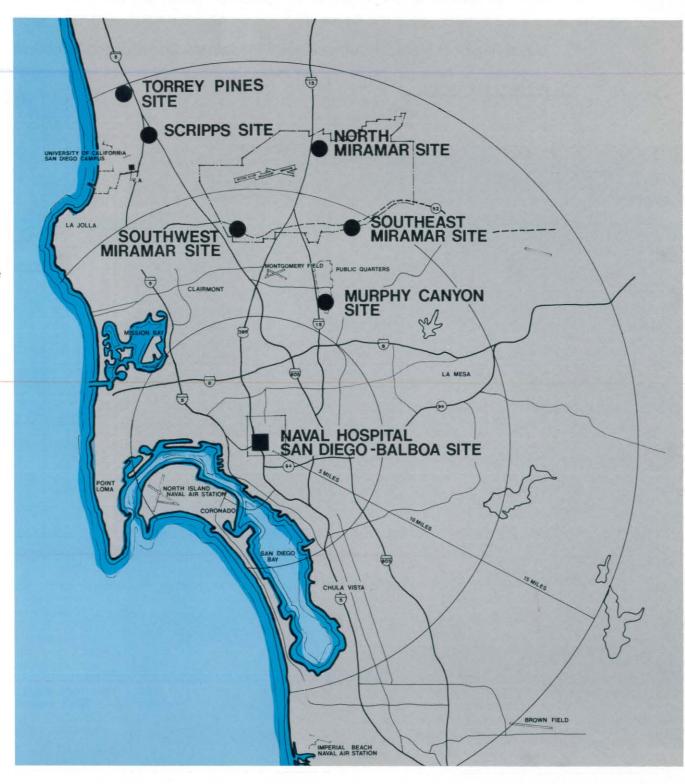


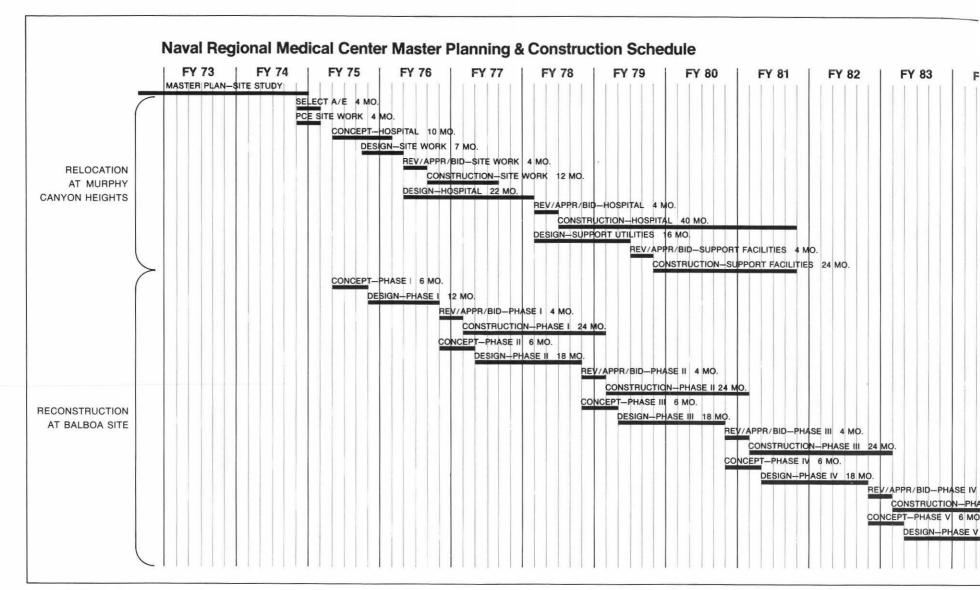


Station San Diego and aboard ships. These beneficiaries are provided their primary health care by the regional dispensaries located at those bases. At present, the Balboa Park site is approximately central to the bulk of the eligible population. Within the next decade, however, the Murphy Canyon Heights site will be at the demographic center of eligible beneficiaries.

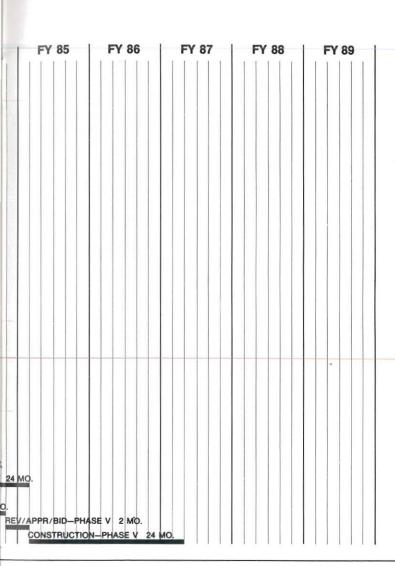


The NOISE ZONE MAP indicates that the Murphy Canyon Heights site is located approximately half-way between San Diego International Airport (six air miles) and Miramar Naval Air Station (seven air miles). As shown on this map, the site is well away from Noise Zones 2 and 3 of those airports. No significant aircraft noise problem is anticipated at this site from operation at these airports. Montgomery Field, a County-operated airport serving small recreational and private executive aircraft, is located approximately two and one-half miles northwest of the site. Therefore, no significant noise or hazard problems are anticipated at the Murphy Canyon Heights site. The Balboa Park site is in Noise Zones 2 and 3 and will remain so for the foreseeable future.

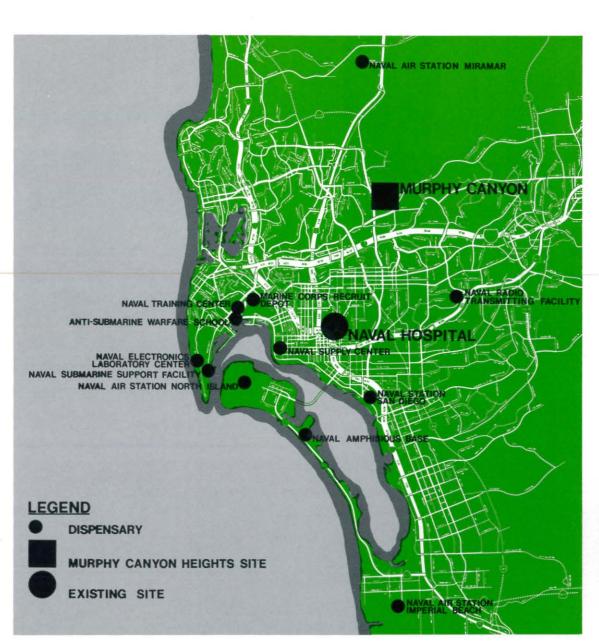




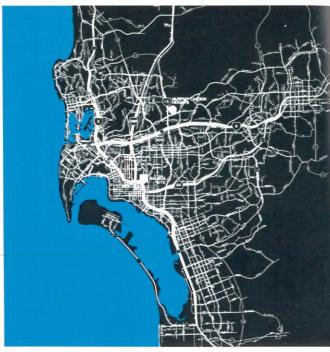
A PLANNING AND CONSTRUCTION SCHEDULE, based on a reasonable funding program, illustrates the necessarily extended phasing of construction at the Balboa Park site and indicates the possibility of completing the Medical Center at the Murphy Canyon Heights site in FY 1981, approximately six years earlier than at the existing site.



CENTRAL LOCATION of the Medical Center, relative to professional support of the dispensaries in the Regional Medical Program, is not a major consideration as a circuit rider system is used. As shown on the map, service to the dispensaries from Murphy Canyon Heights would involve little additional travel over that required from the Balboa site.





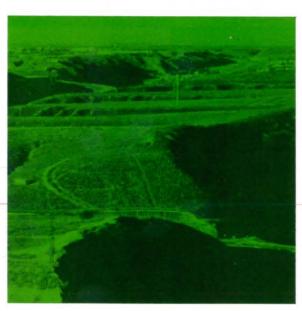


SITE ACCESSIBILITY to the highway system is not a significant consideration as both sites are readily accessible by means of the excellent freeways serving the entire metropolitan San Diego area. By the time the Medical Center is completed, the Murphy Canyon Heights site will be near the demographic center of the region.

COMPARATIVE ANALYSIS OF BOTH SITES ON MAJOR DESIGN FACTORS

KEY EXCELLENT GOOD FAIR POOR	4 3 2 1	MURRAY CANYON HEIGHTS	BALBOA
CENTRAL TO ELIGIBLE POPULATION		3	4
ACCESS TO FREEWAY AND PUBLIC TRANSPORTATION		3	4
IMPACT		4	3
SITE CONDITIONS, TOPOGRAPHY, ZONING, UTILITIES		4	2
AIRCRAFT NOISE, AIRCRAFT NOISE, HEIGHT LIMITATIONS		3	1
COMPATIBILITY OF SURROUNDING ACTIVITIES		4	2
ADEQUACY OF LAND FOR EXPANSION POTENTIAL		3	1
TOTAL PROJECT COST		4	1
ELAPSED TIME FROM START TO COMPLETION OF CONSTRUCTION		4	1
IMPACT ON STAFF, QUALITY OF HEALTH CARE, DURING CONSTRUCTION		4	1
ABILITY OF ULTIMATE PLAN TO PERFORM MISSION		4	3
PHYSICAL CONSTRAINTS		4	1
TOTAL		44	24

To provide a graphic summary for the comparative analysis of the two solutions, a chart of MAJOR DESIGN FACTORS has been developed. Twelve design factors have been selected and weighted according to their relative importance. The resultant total of advantage points lead to an obvious conclusion.



It is apparent that the Naval Regional Medical Center, San Diego is at a CROSSROADS, and that the obsolete physical plant must be substantially replaced at the earliest possible time. Reconstruction at the Balboa Park site can solve many, but not all, of the critical problems burdening present operations. Relocation to Murphy Canyon Heights is the preferred solution from both economic and functional standpoints. Construction of a new Medical Center at Murphy Canyon Heights will assure the optimum environment for provision of comprehensive health care services to the Naval community in the San Diego region.

